ABSTRACT

A system for switching variable size packets in a network is disclosed. The system comprises at least one ingress controller which receives a plurality of packets and which segments each of the packets into fixed sized fragments. The at least one ingress controller has a time-clock. The time clocks of all ingress controllers are synchronized to within a tolerance. Each fragment is tagged with at least a unique source of ID, time-stamp, and a fragment-number to form a cell. Each cell belongs to one packet having the same time-stamp value. The ingress controller sends each of the cells through a link such that a cell's destination is reachable through that link. The system includes a fabric element which receives cells from a plurality of inputs links. The cells are ordered. The fabric element sends ordered cells through a plurality of outputs and through which the destination of the cells is reachable. The cell order is defined such that a cell ahead of another either has a lagging time stamp, or if the timestamp is the same the cell ahead of another has a source-id which has a predetermined priority, or if both the timestamp and the source-id are the same the cell ahead of another has a lagging fragment-number. The system finally includes at least one egress controller which receives the ordered cells from the plurality of input links, and sends the ordered cells through an output where such order results in complete packets. A packet switching device in accordance with the present invention solves the cell ordering and packet reassembly issues using a unified distributed method in a multi-stage interconnect network.